Meade® 7", 8", 10", 12", 14", and 16" LX-Series Telescopes

Diffraction-limited Schmidt-Cassegrain and Maksutov-Cassegrain optics, assembled into advanced electromechanical systems.

The large apertures of Meade LX-Series catadioptric (mirror-lens) telescopes permit the use of higher observing magnifications than is the case with smaller instruments, and because of the telescopes' greatly increased resolution and resolving power, extremely fine celestial detail may be observed and photographed. The four principal satellites of Jupiter become finite-sized orbs rather than pinpoints; the planet itself, under favorable atmospheric conditions, is an intricate web of whirls, festoons, and discontinuities. Saturn's rings resolve into finer detail, with at least 3 rings observable, and with detectable color variations. Six of Saturn's satellites are visible in revolution about the planet. Numerous features of the Martian landscape, including the white polar cap, are clearly identifiable. The Moon is a veritable treasury of incredibly fine fault lines, craterlets, and rilles. Deep-space phenomena take on a new character when explored through the tremendous light gathering capability of the 7", 8", 10", 12", and 14" models. Galaxies merely visible in smaller telescopes begin to show their essential structure; globular star clusters are resolvable in fine detail, in some cases to the core of the cluster; diffuse gas clouds such as the Orion Nebula are visible in such wide extension that the nebulosity may fill the field of view. This listing only hints at the breadth of galactic and extragalactic objects visible through the eyepiece of a Meade 8", 10", 12", or 14" SCT or 7" MCT model: it is a rare observer who might in a lifetime view all of the enumerated phenomena in the above categories.

Meade Schmidt-Cassegrain Optics: In astronomical optics the term *diffraction-limited* is used to rank an optical system as being of professional quality. Simply put, diffraction-limited means that the performance and resolution of an optical system are limited only by the size of the theoretical stellar diffraction image — *i.e.,* limited only by the inherent aperture of the system and by the laws of physics. Meade *hand-matched* and *hand-figured* Schmidt-Cassegrain and Maksutov-Cassegrain optical systems — in continuous, independent, random tests by advanced amateurs and in definitive test reports by leading

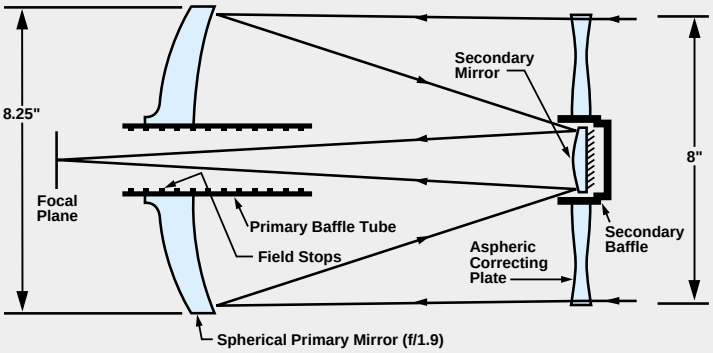
Meade LX-Series telescopes *(below, right to left)*:
8" LX90 Schmidt-Cassegrain; 7" LX200GPS Maksutov-Cassegrain;
8", 10", 12", and 14" LX200GPS Schmidt-Cassegrains.

"Over the past few days I have put my new 10" LX200GPS through exhaustive testing, optically, mechanically, and electronically. My conclusion is simple: this is without question the most advanced amateur telescope I have yet used (and I have used many), an elegant and important evolution of the LX200 I previously owned. In terms of pointing precision, optical resolution, electronic sophistication, and almost every other significant feature one could imagine — not to mention ease of use — the telescope is simply miles ahead. I have tried hundreds of slews to objects in the database and every one ended up with the object pinpoint-centered in the field…The value of the microfocuser is difficult to overstate: images of the Moon and Jupiter, for example, are very tightly focused; extremely precise focusing in both visual and CCD applications is now easy to accomplish. GPS alignment is very accurate and of real assistance in getting the scope up and running quickly each night. For CCD imagers like me, the primary mirror lock has finally, and completely, resolved the issue of mirror shift during focusing…This is just a magnificent astronomical instrument." **— John E. Hoot, San Clemente, CA.**

astronomical magazines (*e.g.,* see pp. 32, 34, and 39) — are consistently ranked as diffraction-limited. That Meade Schmidt-Cassegrain and Maksutov-Cassegrain optics carry such a reputation worldwide is perhaps the prospective purchaser's best assurance of optical quality.

Astrophotography: Many Meade Schmidt-Cassegrain owners have done fine, high-resolution photography of the Moon, planets, and deep-space, as the photos on these pages confirm. A large complement of optional accessories, pp. 62 - 63, is available for virtually every type of photographic application.

CCD Imaging: Creating a multifold increase in the effective aperture of any Meade telescope, CCD imagers enable the imaging of the planets and deep-space objects with a level of resolution and detail heretofore impossible to achieve. Many of the finest astronomical images in this catalog *(e.g.,*



In the Schmidt-Cassegrain design of Meade 8", 10", 12", 14", and 16" models, light enters from the right, passes through a thin lens with 2-sided aspheric correction ("correcting plate"), proceeds to a spherical primary mirror, and then to a convex secondary mirror. The convex secondary mirror multiplies the effective focal length of the primary mirror and results in a focus at the focal plane, with light passing through a central perforation in the primary mirror.

Meade 8", 10", 12", 14", and 16" models include oversize primary mirrors (*e.g.,* the primary mirror of the 8" telescope is 8.25" diameter), yielding fully illuminated fields-of-view significantly wider than is possible with standard-size primary mirrors. It is this phenomenon which results in Meade Schmidt-Cassegrains having off-axis field illuminations about 10% greater, aperture-for-aperture, than other Schmidt-Cassegrains utilizing standard-size primary mirrors. Field stops machined into the inside-diameter surface of the primary mirror baffle tube significantly increase lunar, planetary, and deep-space image contrast. These field stops effectively block off-axis stray light rays.

The Orion Nebula (M42). Chuck Kimball captured this fine photographic image with his Meade 10" LX200 Schmidt-Cassegrain using hypered Kodak PPF-400 film. The telescope was CCD autoguided throughout the 30-minute exposure. Writes Mr. Kimball: "Since my workload hasn't permitted me any darkroom time, this is a raw, unmanipulated print done at the Price/Costco one-hour lab near my home."

see pp. 40, 43, 51, 53, and other captioned pages) were obtained with a CCD imager.

Meade LX10, LX90, and LX200GPS Schmidt-Cassegrains: Meade Schmidt-Cassegrain telescopes include a wide range of features and specifications, permitting a choice of telescope precisely tailored to each buyer's requirements. The tube assemblies of LX10, LX90, and LX200GPS models utilize identical optical systems. Differences among the various models lie primarily in the relative levels of mechanical and electronic sophistication. Detailed descriptions of all models are presented in pages 28 through 57; basic model concepts are as follows:

Control panel of Meade 7", 8", 10", 12", and 14" LX200GPS models, showing the Right Ascension analog setting circle.

8" LX10 Schmidt-Cassegrain: Responding to the demand for a relatively light weight, moderately-priced 8" Schmidt-Cassegrain, the Meade 8" LX10 is nonetheless fully qualified as a serious instrument. The LX10 operates for about 50 hours from its internal battery-powered motor drive system. The standard-equipment hand controller enables precise 2x guiding corrections in Right Ascension during long-exposure astrophotography; corrections in Declination may be effected from the same hand controller by adding the optional Declination motor.

Saturn emerging from behind the Moon, during the occultation of November 3, 2001. Etienne Bonduelle of Cambrai, Northern France, obtained this remarkable image with his Meade 8" LX90 Schmidt-Cassegrain using a webcam adapted to the telescope. Comments Mr. Bonduelle: "The LX90 is really a fabulous telescope. Optically and mechanically, it provides everything I need in my high-resolution lunar and planetary work."

8" LX90 Schmidt-Cassegrain: Announced in June, 2000, the Meade 8" LX90 Schmidt-Cassegrain is the first full-capability, computer-controlled 8" Schmidt-Cassegrain ever offered in its price range — a telescope that includes many advanced features:

Dual-Axis worm-gear drive system: With 4.9"-diameter gears for smooth sidereal-rate tracking and slewing, the

Images of astronomical objects and product reviews for Meade LX200 and LX200GPS telescopes are included in this catalog and are appropriately identified. While LX200GPS models include many electromechanical innovations and software advancements compared to their predecessor LX200 models, both series share identical optical systems, GO TO pointing precision, and other features. In all specifications the performance of LX200GPS models is equal or superior to that of the previous LX200 models.

LX90's microprocessor-controlled drive system allows for precise long-exposure photographic or CCD imaging.

Autostar Computer Controller: Use Autostar to GO TO any of over 30,000 celestial objects in the LX90 database or to any object of known RA and Dec., automatically, at the push of a button and at a speed of 6.5°/second on both axes, simultaneously. The telescope's pointing precision is a remarkable 5-arc minutes or better.

Nine selectable slew speeds: Push the Autostar speed button to change dual-axis speeds from a slow 1x sidereal to a fast 6.5°/second in any of nine increments.

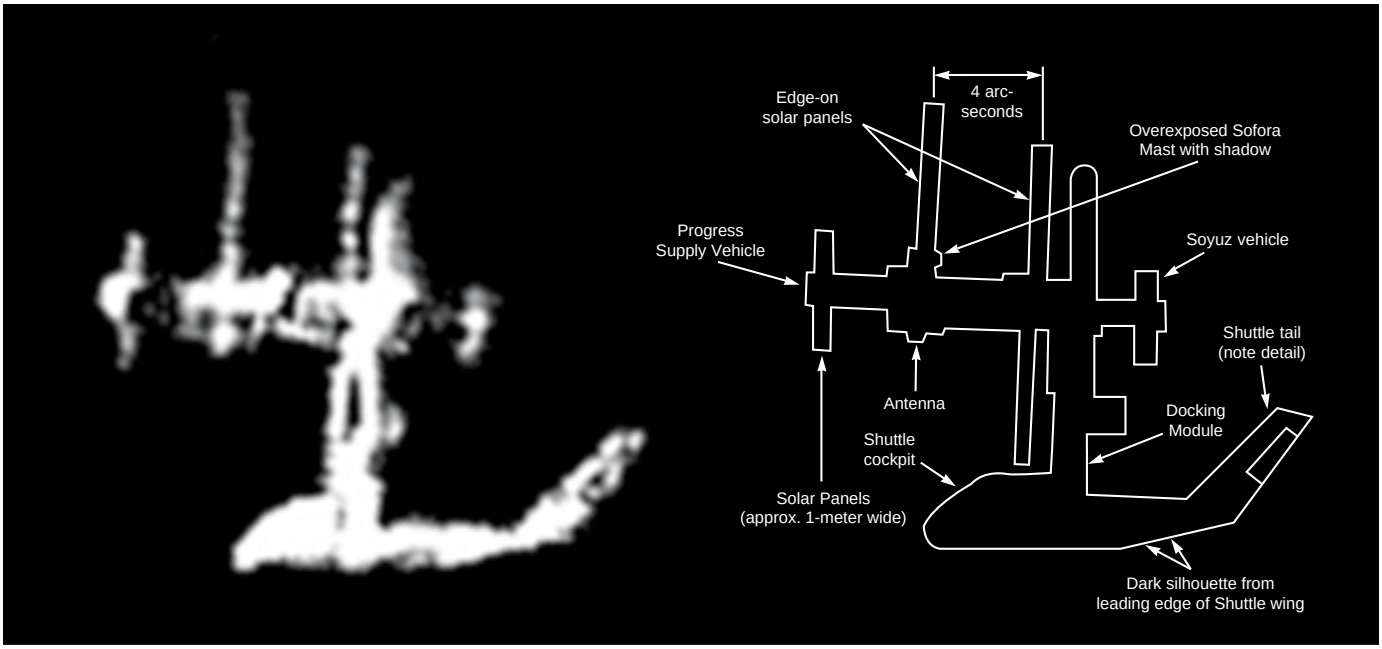
Die-cast aluminum, double-tine fork mounting: The LX90's fork mounting yields all of the rigidity required for advanced applications of the telescope, from high-power, high-resolution visual observing of the Moon and planets to long-exposure astrophotography or CCD imaging. A 3-connector control panel is integrated to one of the fork arms.

Variable-height Standard Field Tripod: Consistent with the mechanical standards of the LX90 system, the chromed-steel Meade Standard Field Tripod (the exact same tripod included with Meade 8" and 10" LX200GPS models) provides rock-solid support for the telescope.

Cordless operation: Power the telescope from eight (user-provided) C-cell batteries located internal to the telescope's drive base.

8" and 10" LX200GPS Schmidt-Cassegrains: Meade 8" and 10" LX200GPS Schmidt-Cassegrains, announced in

Just north of the Sinus Medii region of the Moon: This mosaic shows the three large lunar craters Ptolemaeus *(top),* Alphonsus, and Arzachel on May 20, 2002. Imaged by Christophe Béthune of St. André-les-Vergers, France, with the Meade 8" LX200 Schmidt-Cassegrain. Mr. Béthune used a Philips webcam with the Meade #140 2x Barlow lens to extend the telescope's effective focal length.



350 miles above Boston: Ron Dantowitz of Hayden Planetarium, Boston, Mass., used a Meade 12" LX200 Schmidt-Cassegrain optical system in conjunction with C-Sat satellite tracking software to obtain this remarkable video image of Space Shuttle *Atlantis* docked with Space Station *Mir* on November 16, 1995. At the time of the exposure the docked *Atlantis-Mir* were 350 miles above Boston and traveling at a speed of 17,100 miles per hour. The outline drawing at right points out specific features of the two spacecraft, including such details as the Shuttle's rudder and wing-silhouette. Although *Mir's* solar panels are only about one meter (39") wide, they are clearly resolved by the telescope's 12" optics, even at a distance of 350 miles. C-Sat software works with any Meade LX200 or LX200GPS model through a personal computer to locate and track automatically over 3500 Earth satellites. For further information access the C-Sat web page at www.claycenter.org. *Photo courtesy Museum of Science, Hayden Planetarium, Boston, Mass.*

Ultra-High Transmission Coatings (UHTC) Group: As fully described on pages 26 - 27, the Meade UHTC coatings group provides, for the first time on commercial telescopes, a series of highly specialized, exotic optical coatings which dramatically increase image brightness. Averaged over the entire visible spectrum (450 nm. to 700 nm.), total light transmission to the telescope focus is increased by about 20%. Meade LX10, LX90, and LX200GPS telescopes equipped with UHTC present a quantum leap in image brightness on the full range of celestial objects.

September, 2001, present to the serious amateur instruments ready for an amazing array of state-of-the-art capabilities. Built into the new LX200GPS fork mounts — the strongest, most rigid mountings available on Schmidt-Cassegrains of these apertures — is one of the most advanced electronic packages ever offered, at any price, in a commercial telescope, an electronic package that makes using these telescopes a revelation, for the beginner or for the most experienced observer. Imagine being able to select any of over 145,000 celestial objects — objects that include entire catalogs of galaxies, nebulae, star clusters, double stars, and variable stars, as well as all eight of the major planets from Mercury to Pluto — and, at the push of a button, having the telescope automatically move to the object and center it in the telescopic field to a precision of within arcminutes.

Meade 10" LX200GPS Schmidt-Cassegrain; shown with standard-equipment microfocuser and Autostar II hand controller and with optional 10"/12" Superwedge. The telescope's primary mirror lock-knob is located on the rear cell, above the manual focus knob.

The Pelican Nebula (IC 5070) in Cygnus. A 90-minute exposure by Philip Perkins with the Meade 10" LX200 Schmidt-Cassegrain.

Meade LX200GPS models perform such feats of pointing precision time after time, on object after object, enabling the user to observe or photograph extremely faint galaxies, for example, at the very limit of the telescope's capability, knowing that the object is precisely located at the telescope's field center. In addition dozens of telescope functions — from changing slew speeds to automatic GO TO — can be actuated from the Autostar II hand controller.

12" and 14" LX200GPS Schmidt-Cassegrains: The large light-collecting apertures of Meade 12" and 14" Schmidt-Cassegrains extend the serious amateur's ability to engage in a wide range of significant astronomical research, from variable star observing to planetary study and supernova imaging. Combining the LX200GPS package of advanced electronics and precise automatic GO TO object-location with large, extremely rigid fork mountings, Meade 12" and 14" models present an amazing level of detail and resolution in the solar system and in deep-space. See pages 40 - 47 for technical specifications on these revolutionary instruments as well as for examples of their

extraordinary CCD imaging and astrophotographic capabilities.

16" LX200GPS Schmidt-Cassegrain: Now installed in hundreds of school and college observatories, as well as those of advanced amateurs, around the world, the Meade 16" LX200GPS is the largest Schmidt-Cassegrain telescope currently in production. For the advanced amateur who can appreciate what a research-class instrument can bring to his or her observing program, or for the school or college astronomy department seeking a first-class teaching telescope, the Meade 16" LX200GPS is without equal. As imaging tools, Meade 16" LX200GPS Schmidt-Cassegrains have been responsible for some of the most impressive results ever obtained by amateurs or professionals. See pp. 48 - 57 for further information.

"Here at the Arkansas Sky Observatory we use Meade telescopes nightly for the highly sophisticated ASO Sky Patrol program, which, in addition to routine monitoring of Mars and Jupiter, does very precise astrometric and photometric observations of literally hundreds of objects monthly. Our observations are used routinely by planetary observatories and the American Association of Variable Star Observers; our comet and asteroid observations number in the thousands and we have been assigned Harvard Minor Planet Center observing codes H41 and H43. Our work involves the monitoring of no fewer than 18 comets and many cataclysmic variable stars, objects which require multiple determinations each night. This regimen would be virtually impossible without the highly accurate GO TO capability and precise tracking of our Meade 12" and 16" Schmidt-Cassegrains. On occasion we take as many as four readings of each object in one night, sometimes resulting in over 140 CCD images with the 16" telescope of objects as faint as 20th-magnitude. These objects, and the very small star fields in which they are located, can not even be seen visually, and we rely completely on the accuracy of the telescope's GO TO pointing to locate them. I might add that the magnitude reach of the telescopes, especially important in our studies of faint comets, asteroids, and near-Earth objects, has been dramatically augmented in our dark mountain skies with your new UHTC coatings...All four of our Meade telescopes will access a faint comet after a slew completely across the sky and position it near dead center on the CCD chip, allowing us to see each acquired field on television monitors. Such acquisition is made possible by the precision of the Autostar's GO TO. The ease of coupling our LX200 and LX200GPS telescopes to personal computers enables us to control the telescopes, from Autostar programming to focusing of the image, remotely via computer...The technology in Meade LX200GPS telescopes provides to the amateur what was totally unavailable, and probably unthinkable, even to the professional astronomers of 30 years ago when I began my study of astronomy. Your company has opened the door for serious amateur astronomers to perform dedicated research." **— Dr. P. Clay Sherrod, Arkansas Sky Observatory, Morrilton, Arkansas**

The planet Saturn. A CCD image with the Meade 10" LX200 Schmidt-Cassegrain by António Cidadão of Oeiras, Portugal. *(See p. 33 for additional planetary images by Mr. Cidadão.)*

Spiral Galaxy (M106) in Canes Venatici. A CCD (LRGB) image (120-mins. L, 15-mins. each R and G, 24-mins. B) by David M. Jurasevich with the Meade 16" LX200 Schmidt-Cassegrain telescope at Mt. Wilson Observatory, Mt. Wilson, Calif.; the image was processed by Dave Held of La Jolla, Calif.

7" LX200GPS Maksutov-Cassegrain: The Meade 7" LX200GPS Maksutov-Cassegrain exploits fully the extra-ordinary imaging characteristics of the Maksutov design. Housed in a compact optical tube assembly, the Meade 7" Maksutov optical system rivals the optical performance of even a fine *ED* apochromatic refractor, and, mounted aboard the awesome electromechanical capabilities of the Meade LX200GPS fork mounting, the telescope is a formidable astronomical tool. See pp. 38 - 39 for further details.

Equatorial Wedges: For placement of Meade LX200GPS models in the equatorial mode during long-exposure CCD imaging or photography, three equatorial wedges are available: the Standard Equatorial Wedge for 8" Meade SCT telescopes *(e.g., see p. 29);* the 10"/12" Superwedge for 10" and 12" LX200GPS models *(see p. 20)*; and the 14" Superwedge for the 14" LX200GPS *(see p. 45)*.

Field De-rotaters: With the optional Meade #1220 Field De-rotater, field rotation during long-exposure photographic imaging with Meade LX200GPS models in the altazimuth mode can be fully and precisely compensated for, without recourse to an equatorial wedge *(see p. 24)*.

Astrophotographs by Philip Perkins with the Meade 10" LX200 Schmidt-Cassegrain telescope. *Above:* **The Lagoon Nebula (M8) in Sagittarius;** a composite image including exposures of 60-mins. and 85-mins. The two negatives were scanned and digitally combined to form the final image shown here. *Facing page, clockwise from lower-left:* **The Horsehead Nebula (IC 434) in Orion;** composited from exposures of 90-mins., 60-mins., and 120-mins. The glare at left results from the nearby bright star Zeta Orionis. **The Reflection Nebula (NGC 7023) in Cepheus;** a composite of three exposures of 2 hrs., 2 hrs., and 90-mins. **The Rosette Nebula (NGC 2237) in Monoceros;** a composite of two exposures of 50-mins. each. **The Whirlpool Galaxy (M51) in Canes Venatici;** a composite of two photographic exposures of two hours' duration each. All exposures were taken in southern France, using hypered Kodak Ektapress Multispeed PJM-2 film.

Philip Perkins of Wiltshire, England, used his Meade 10" LX200 Schmidt-Cassegrain telescope to obtain this stunning series of high-resolution deep-space photographic exposures. Working in the clear, steady skies of southern France and typically taking two or more very long, autoguided exposures of an object, then scanning, digitally stacking, and processing the images, Mr. Perkins has significantly extended the level of imaged detail. Additional examples of Mr. Perkins' work can be accessed at his website *www.astrocruise.com.* Comments Mr. Perkins:

"I believe that my astrophotographs genuinely represent what the typical user may achieve with the 10" LX200. My work has been done largely unsupervised; with a few exceptions I have not received any outside assistance in my use of the instrument. Further, my LX200 has not been modified in any way; I use it just the way Meade manufactured it, and I think the results speak for themselves. The telescope's optics, stability, and tracking accuracy — all of which are crucial in my applications — are truly remarkable, fully up to the demands that my photographic program requires. My LX200 is now nearly four years old, and during that time it has received heavy use, including 2000-mile round trips to southern France four times a year. The telescope is everything I could possibly have expected it to be."